

Figure 2. Diagram of nest platform used for lowering of nest.

## HABITUATION TO HUMAN DISTURBANCE IN NESTING ACCIPITERS

by

**Julie Ann Lee**

**Department of Zoology**

**Brigham Young University**

**Provo, Utah 84602**

### *Abstract*

Data are presented on habituation to human activity by 2 accipiters, the Goshawk (*Accipiter gentilis*) and the Cooper's Hawk (*A. cooperii*). Human activities near nests include snowmobile traffic, cross-country and alpine skiing, hiking, horseback riding, and the construction of homes. Two possible explanations for apparent "tameness" in these birds are as follows: 1) The hawks tolerating heavy use of nesting areas by people were younger, less experienced birds, and 2) The nest areas are traditional for Goshawks and Cooper's Hawks, providing secure nest trees and plentiful prey.

### *Introduction*

Effects of disturbance at nest sites have been documented for many raptor species (Fyfe and Olendorff 1976, Hennessy 1978). Stalmaster (1978) discussed responses of the Bald Eagle (*Haliaeetus leucocephalus*) to human activity on eagle wintering grounds. Information is available about the effects of disturbance on raptor behavior, but little in-

formation is available on behavioral adaptations and habituation to humans. Accipiters, particularly Goshawks, are described as sensitive to human activity and would be expected to be sensitized to human activity at the nest (Hennessy 1978).

### *Study Area and Methods*

The 800 ha study area is located 24 km north of Provo, Utah. Elevation ranges from 1991–2195 m. Approximately 80 percent of the area is forested, predominately aspen (*Populus tremuloides*) with some mixed stands including white fir (*Abies concolor*) and Rocky Mountain douglas fir (*Pseudotsuga menziesii*). A ski resort covers about 390 ha and the rest of the area is used for cross-country skiing and snowmobiling during the winter months. Extensive use of the area occurs during the summer by horseback riders, hikers and motorcyclists.

Three nests in "disturbed" areas were observed in 1979—2 Goshawk and 1 Cooper's Hawk, and 2 Goshawk nests in 1980. Data on breeding behavior were collected from 6 March–1 August, 1979, and 6 February–20 July, 1980. Observations were made from ridges up to 0.8 km from nests early in the season. Blinds were constructed at all Goshawk nests. Weekly visits were made to the Cooper's nest. Productivity and responses to various forms of human activity were recorded.

The nests will be discussed as follows. One Goshawk nest (Mandan) was located on the ski resort, 32 m from a ski run in 1979 and 31 m away in 1980. The second Goshawk nest, about 1100 m northwest of the first is referred to as the Meadows nest. The Cooper's Hawk nest was 914 m northwest of the Meadows Goshawk nest.

### *Results*

#### *Mandan Nest*

Goshawks were first seen at Mandan (Fig. 1) on 9 March, 1979 and 25 February, 1980. In 1979 a bird was calling (similar to begging of young Goshawks) in an area about 213 m southwest of where the Mandan pair eventually nested. For a description of Goshawk vocalizations, see Schnell (1958). Although the bird was not visible from the ski trail, it is likely that it could see the skiers, because the hawk was located between two trails. A minimum of nine skiers per min. passed as the bird vocalized.

Additional "disturbance" at this site was the construction of a house 91 m from the nest in 1979 and 205 m away in 1980. Building began before the Goshawks were seen in the area. Activity near the nest included noise associated with construction, cutting of trees, and the presence of 3 or more persons for a minimum of 8 hours daily. Cement trucks passed within 31 m of the 1980 nest 2 or more times daily. As the snow melted, hikers and horseback riders rather than skiers passed within 35 m of both nests.

A blind was built 16 m from the nest on 8–14 June, 1979 and 21 m away in early April, 1980. Disturbance associated with construction of the blind was limited to one half hour per day, every 2–3 days in 1979. Young Goshawks were about a week old at this time. The female watched the building operations of the house and blind apparently without altering her brooding position. The first attack on a human by the female came when a tree 1 m from the nest was climbed to cut branches that obscured the view from the blind. In this instance she stood on the edge of the nest, on one foot, until the climber was level with the lower edge of the nest before she flew at him. After this initial attack the female left the nest and flew at me, vocalizing, each time I entered the woodlot. The male usually flew toward the nest and made passes from a distance of 15

m or more. When I climbed to the blind I was struck solidly on the back, head, or arms by the female. Aggressive behavior ceased within a half hour of entering the blind.

The 1980 blind was installed prior to egg laying. Adults were not present during construction, and the blind was finished in 2 days. The new nest was further from the unfinished house, and closer to the ski trail or road. The behavior of the adults was unchanged from 1979.

#### *Meadows Nest*

Goshawks were first seen in the vicinity (Fig. 2) on 6 March 1979 and 6 February 1980. While cross-country skiing in 1979 a Goshawk flew directly in front of me, cackling, then landed approximately 9 m above me in a conifer. The bird stood on one foot as I passed underneath.

The nest used in 1978 was in a more secluded part of the woods, but by 21 March 1979, it was evident that this pair of Goshawks had chosen an alternate nest for use in 1979. This nest was over a dirt road used extensively for recreation.

During March–May snowmobiles passed the nest a minimum of 2 times per day, 3 days a week. The responses of the Goshawks varied. On 31 March 1979, the male flushed from a perch tree as a snowmobile passed underneath him. He also flushed in the presence of a snowmobile on 19 April, but was seen holding prey a few meters off the trail only a few moments later. He may not have flown from the snowmobile, but rather, chased a prey animal that had been frightened by the machine.

The same snowmobile came by the nest from the other direction later in the day. The female was perched by the nest and did not flush until people stopped in front of her. She then made a short dive toward the snowmobile, and left the nest site. The hawks appeared to be habituated to moving machines.

A blind was placed on the ground in snow about 30 m from the nest on 1 May 1979. I approached the blind daily and the incubating female did not move except to watch me; she often slept. A tree blind was installed 30 m from the nest on 12–14 June when the chicks were about a week old. The female brooded or stood on the edge of the nest during the blind construction. She did not appear to be disturbed by my approach to the blind, although I often walked within a few meters of her as she perched between the nest and the blind. After mid-June motorcycles, hikers, or riders were seen passing daily beneath the nest. The female never left the nest to attack, even when on one occasion hikers stood under the nest yelling at her.

Additional "disturbance" at this nest included nest tree climbing on four occasions and shooting in the woodlot. The first time the tree was climbed, prior to egg laying, neither parent was nearby. The other three times the female protested vocally and on one occasion the male attacked and joined in cackling.

Shots were heard one day while I was observing the hawks. The female made no response from the nest. The male, perched a few hundred meters south of the nest, did not respond. Shooting was heard by others on at least two separate occasions.

The male at this nest was more aggressive than the female in both years. He flew at me, cackling, two times when I left the woods. In 1980 as I watched the incubating female from a road 31 m from the nest, the male flew at me, struck me in the face, causing me to fall. The behavior of the adults was consistent from 1979 to 1980.

#### *Cooper's Hawk Nest*

The Cooper's Hawk nest was 38 m from the road. This area was searched repeatedly

from April until mid-May when I discovered the nest downhill and just out of view from the road. The hawks remained silent if hikers were on the road, but flew from the nest when a person left the trail. The short distance from the trail to the nest should have allowed the hawk to hear passersby. They did not respond, however, unless people were in view.

### *Discussion and Summary*

Inter- and intrasexual variations were noted in the responses of Goshawks to human disturbance. The Mandan female became aggressive after human intrusion at the nest when the young were less than a week old. Her mate vocalized only when someone was in the vicinity of the nest. The site received daily "disturbance" from a variety of sources.

Contrary to the Mandan female, the Meadows female appeared to be very tolerant. Her mate was the more aggressive, yet these birds habituated to high levels of activity. Despite the activity in and around the nest woods each pair hatched and fledged four young in 1979. The Mandan pair fledged four again in 1980, but one of three young from the 1980 Meadows nest was taken by a falconer. Normal fledging in areas of low-medium disturbance in another study in Utah was found by Hennessy (1978) to be 1.2 young on the average with a maximum of 2.0.

Why would Goshawks select a heavily used area for nesting when other undisturbed habitat was nearby? Why did the birds continue nesting as "disturbance" continued and possibly increased throughout the season?

Both Goshawk home ranges were occupied in 1978. Although the hawks were not color marked, evidence suggests that the birds were the same pairs in 1979 and 1980, as indicated by plumage changes and consistency in behavior. In 1978 the Mandan and Cooper's females were in juvenal plumage in these areas. I conclude that in this situation, the 3 pairs of hawks tolerating heavy use of the nesting areas by people were less experienced, young birds. Lack of experience may have led them to choose less favorable sites in which to nest.

A second conclusion is that these nest areas are traditional for Goshawks and Cooper's Hawks. Each had 3 or more nests, indicating that the areas had been used by hawks for many years. The birds may tolerate "disturbance" in order to use an area that meets their resource requirements. The opening up of habitat by ski trails may have increased the usefulness of the area by providing pathways through the woods for hunting (Hennessy 1978). The birds I observed may have hatched in these areas and returned to seek nesting habitat as is often the case for raptors (Newton 1979). Evidence suggests that if the young grow up in an area of high activity, they accept it.

This study illustrates that although we may not believe an area is suitable for nesting accipiters because of human activity, we should not discount it as being suitable for nesting until a thorough search of the area has been conducted. Individual Goshawks and Cooper's Hawks may be more tolerant than we would expect. Wildlife and forest managers should insure that suitable nest trees are provided where the prey base is adequate even in areas of human activity because some of these areas are obviously suitable for nesting.

### *Acknowledgments*

I thank Robert Redford, Jeanne and Dale Quesenbury, Sarah A. Lee, and the Brigham Young University Zoology Department for funding the study. Field assistance and aid in

preparation of the manuscript were provided by B. Beck, H. Black, C. Elliott, J. Flinders, M. Fuller, D. Johnson, D. Karr, L. Klein, J. Murphy, A. Nelson, M. Shindurling, Sundance Ski Resort, K. Van De Graaff, and C. M. White.

### Literature Cited

- Fyfe, R. W. and R. R. Olendorff. 1976. Minimizing the dangers of nesting studies to raptors and other sensitive species. Canadian Wildlife Service, Occasional Paper Number 23, pp. 5-15.
- Hennessy, S. P. 1978. Ecological relationships of accipiters in northern Utah—with special emphasis on the effects of human disturbance. M.S. thesis, Utah State University, Logan, 66 pp.
- Newton, I. 1979. *Population Ecology of Raptors*. Buteo Books, Vermillion, South Dakota, 399 pp.
- Schnell, J. H. 1958. Nesting behavior and food habits of Goshawks in the Sierra Nevada of California. *Condor* 60:377-403.
- Stalmaster, M. V. and J. R. Newman. 1978. Behavioral responses of wintering Bald Eagles to human activity. *J. Wildl. Mgmt.* 42(3):506-513.

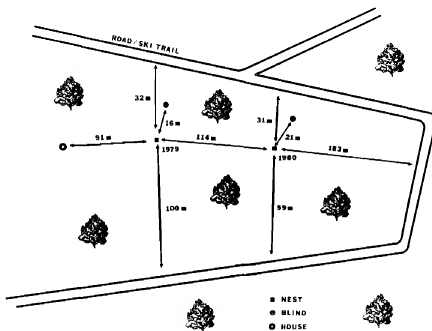


Figure 1. Mandan Woods

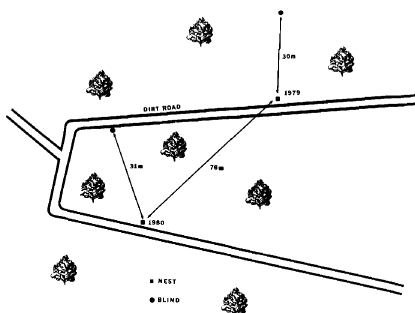


Figure 2. Meadows Woods